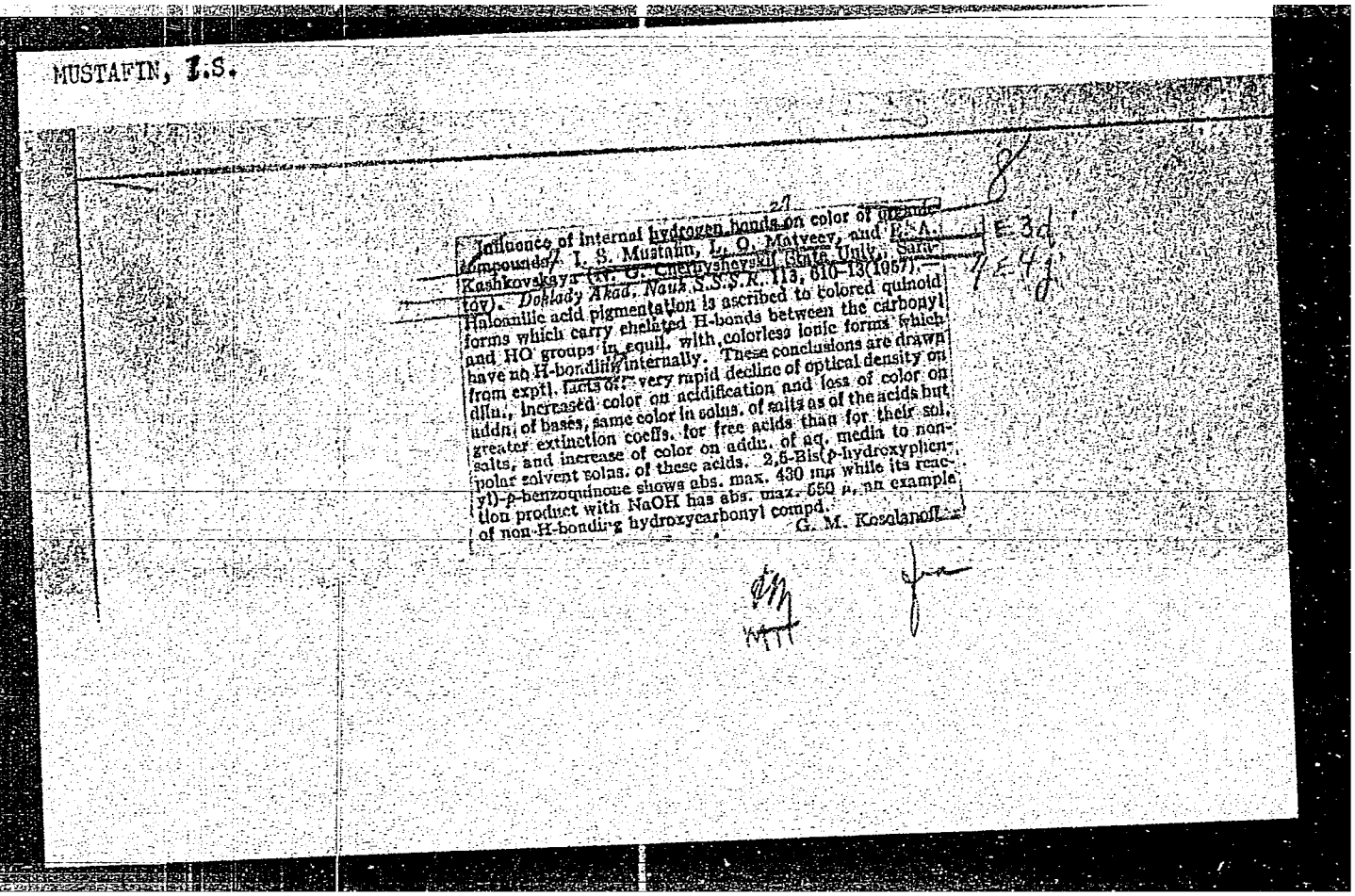

MUSTAFIN, I.S.

27

Influence of internal hydrogen bonds on color of organic compounds. I. S. Mustafin, L. O. Matveev, and E. A. Kashkovskaya (N. G. Chernyshevskii State Univ., Saratov). *Doklady Akad. Nauk S.S.S.R.* 113, 610–13(1957).—Halocrillic acid pigmentation is ascribed to colored quinoid forms which carry chelated H-bonds between the carbonyl and HO groups in equil. with colorless ionic forms which have no H-bonding internally. These conclusions are drawn from exptl. facts of very rapid decline of optical density on dilu., increased color on acidification and loss of color on addn. of bases, same color in solns. of salts as of the acids but greater extinction coeffs. for free acids than for their salts, and increase of color on addn. of aq. media to non-polar solvent solns. of these acids. 2,5-Bis(*p*-hydroxyphenyl)-*p*-benzoquinone shows abs. max. 430 mμ while its reaction product with NaOH has abs. max. 550 μ, an example of non-H-bonding hydroxycarbonyl compd.

G. M. Kosolapoff

E 3d
7E-4d

LISENKO, N. F.; MUSTAFIN, I. S.; MOLOT, L. A.

Chromoxane Violet P, a reagent for a total or separate determination of microgram quantities of aluminum and iron. Part 1: Determination of aluminum and iron in natural waters. Izv. vys. ucheb. zav.; khim. i khim. tekh. 5 no.5:712-716 '62. (MIRA 16:1)

1. Saratovskiy gosudarstvennyy universitet imeni N. G. Chernyshevskogo, kafedra analiticheskoy khimii.

(Aluminum—Analysis) (Iron—Analysis)
(Water—Analysis)

MUSTAFIN, I.S.; LISENKO, N.F.

Analytical properties of phenolic acids of the triphenylmethane series. Determination of aluminum and iron in some metals. Zhur.anal.khim. 17 no.9:1052-1056 D '62. (MIRA 16:2)

1. N.G. Chernyshevskiy Saratov State University.
(Aluminum--Analysis) (Iron--Analysis)
(Chromoxane violet)

ZINGER, O.M.; MUSTAFIN, I.S.; KUL'BERG, L.M. [deceased]

Methods of identification of aromatic amines. Uch.zap. SGU 75:102-107 '62. (MIRA 17:3)

MUSTAFIN, I.S.; KRUCHKOVA, B.S.; SIVANOVA, O.V.

Sensitivity limits of titrimetric analysis. Trudy po khim.i khim.tekh. no.1:121-124 '63. (MIRA 17:12)

MUSTAFIN, I.S.; LENSKAYA, V.N.; TEREKHOVA, R.K.

Interaction between copper and chromium salts. Zhur. neorg. khim. 8 no.10:2314-2317 O '63. (MIRA 16:10)

1. Saratovskiy gosudarstvennyy universitet im. N.G. Chernyshevskogo, kafedra analiticheskoy khimii.
(Copper salts) (Chromium salts)

MUSTAFIN, I.S.; FRUMINA, N.S.; AGRANOVSKAYA, L.A.

Determination of gold in tungsten-based platings by means of variamine blue. Zhur. anal. khim. 18 no.9:1054-1058 S '63. (MIRA 16:11)

1. N.G. Chernyshevsky Saratov State University.

MUSTAFIN, I.S.; FRUMINA, N.S.; KOVALEVA, V.S.

Determination of copper in various substances with the aid of 2,2'-bicinchoninic acid. Zav.lab. 29 no.7:782-785 '63. (MIRA 16:8)

1. Nauchno-issledovatel'skiy institut khimii pri Saratovskom gosudarstvennom universitete.
(Copper--Analysis) (Cinchoninic acid)

MUSTAFIN, I.S.; SIVANOVA, O.V.

Indicators with inner light filters. Hydron III, a mercurimetric indicator. Zhur. anal. khim. 19 no.2:163-167 '64. (MIRA 17:9)

1. Saratovskiy universitet imeni Chernyshevskogo.

MUSTAFIN, I.S.

A.Kh. Batalin's "Analytical chemistry and the trend of its development". Zav. lab. 30 no.1:125 '64. (MIRA 17:7)

TIKHONOV, V.N.; MUSTAFIN, I.S.

Complexometric determination of calcium and magnesium without an iron separation. Zav.lab. 30 no.12:1448 '64.

(MIRA 18:1)

1. Saratovskiy gosudarstvennyy universitet im. N.G.Chernyshevskogo i filial Vsesoyuznogo nauchno-issledovatel'skogo allyuminiyevo-magniyevogo instituta, Berezniki.

MUSTAFIN, I.S.; FRUMINA, N.M.

I.M. Korenman's "Analytical chemistry of potassium". Zhur. anal. khim. 19 no.11:1419-1420 '64. (MIRA 18:1)

SIVANOVA, O.V.; MUSTAFIN, I.S.

Azo coupling of 8-hydroxyquinoline. Zhur. org. khim. 1 no.1:145-147 Ja '65. (MIRA 18:5)

1. Saratovskiy gosudarstvennyy universitet.

TIKHONOV, V.N.; MUSTAFIN, I.G.

Photometric determination of copper in magnesium and magnesium alloys by means of bicinchoninic acid. Zavod. lab. 31 no.3:299-302 '65. (MIRA 18:5)

1. Saratovskiy gosudarstvennyy universitet imeni Chernyshevskogo i Bereznikovskiy filial Vsesoyuznogo aluminiyevo-magniyevogo instituta.

MUSTAFIN, I.S.; IVANOVA, A.N.; LISENKO, N.F.

State of a solution of phenolic acids of the triphenylmethane series. Zhur. anal. khim. 20 no.1 17-25 '65. (MIRA 18:3)

1. Saratovskiy gosudarstvennyy universitet.

L 15988-66 EWT(m)/EWP(t) IJP(c) JD/JG/GS

ACC NR: AT6005602 SOURCE CODE: UR/0000/64/000/000/0193/0196

AUTHOR: Frumina, N. S.; Mustafin, I. S.; Agranovskaya, L. A.; Karakhtanova, Z. G.

ORG: Saratov State University (Saratovskiy gosudarstvennyy universitet)

TITLE: Determination of noble and certain other metals in protective and antithermoemissive coatings

SOURCE: Vsesoyuznaya konferentsiya rabotnikov metallurgicheskoy i khimicheskoy promyshlennosti i sotrudnikov vuzov. Rostov-on-Don, 1962. Peredovyye metody khimicheskoy tekhnologii i kontrolya proizvodstva (Progressive methods of chemical engineering and production control); trudy konferentsii. Rostov-on-Don, Izd-vo Rostovskogo univ., 1964, 193-196

TOPIC TAGS: gold, tungsten, copper alloy, nickel alloy, aluminum alloy, tin alloy, protective coating, quantitative analysis

ABSTRACT: Analytical methods were developed for determining the quality and thickness of protective coatings made of copper-nickel, copper-aluminum, tin-nickel, tin-copper, and gold and used on tungsten and molybdenum articles. After reduction of

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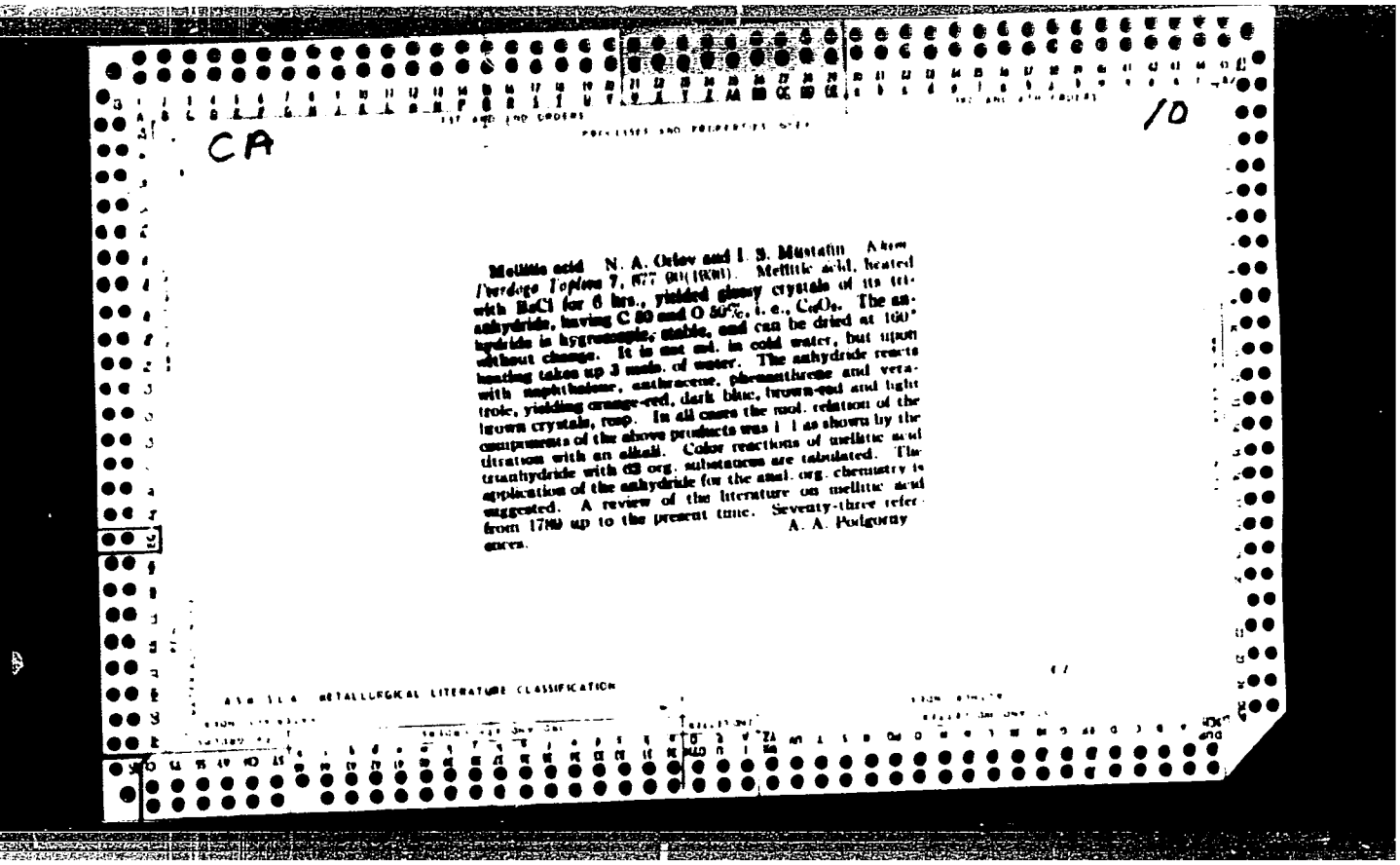
cupric ions to cuprous ions with hydroxylamine, bicinchoninic acid was used to determine copper photometrically in the presence of nickel by means of the colored complex formed by this acid with copper ions at pH 5-12. To determine gold deposited on tungsten, methods of separating the gold from the tungsten backing were studied, and it was found that treatment of the sample with aqua regia inevitably caused some tungsten to go into solution with the gold. It was thus necessary to find a method of determining gold in the presence of tungstate ions and of the components of aqua regia, since evaporation of the latter would cause tungstic acid to precipitate, adsorb gold on its surface, and reduce it to the metallic state. None of the known methods of determining gold was suitable. The problem was successfully solved by using the reagent variamine blue, which was applied to the determination of gold for the first time. Orig. art. has: 1 table.

SUB CODE: 07/ SUBM DATE: 24Mar64/ ORIG REF: 002/ OTH REF: 004

FRUMINA, N.S.; GORYUNOVA, N.N.; MUSTAFIN, I.S.

Spectrophotometric study of bis-(4-sodium-5-tetrazolylazo)-etnyl acetate in aqueous solutions. Zhur. anal. khim. 21 no. 1:7-12 '66 (MIRA 19:1)

1. Saratovskiy gosudarstvennyy universitet imeni Chernyshevskogo.



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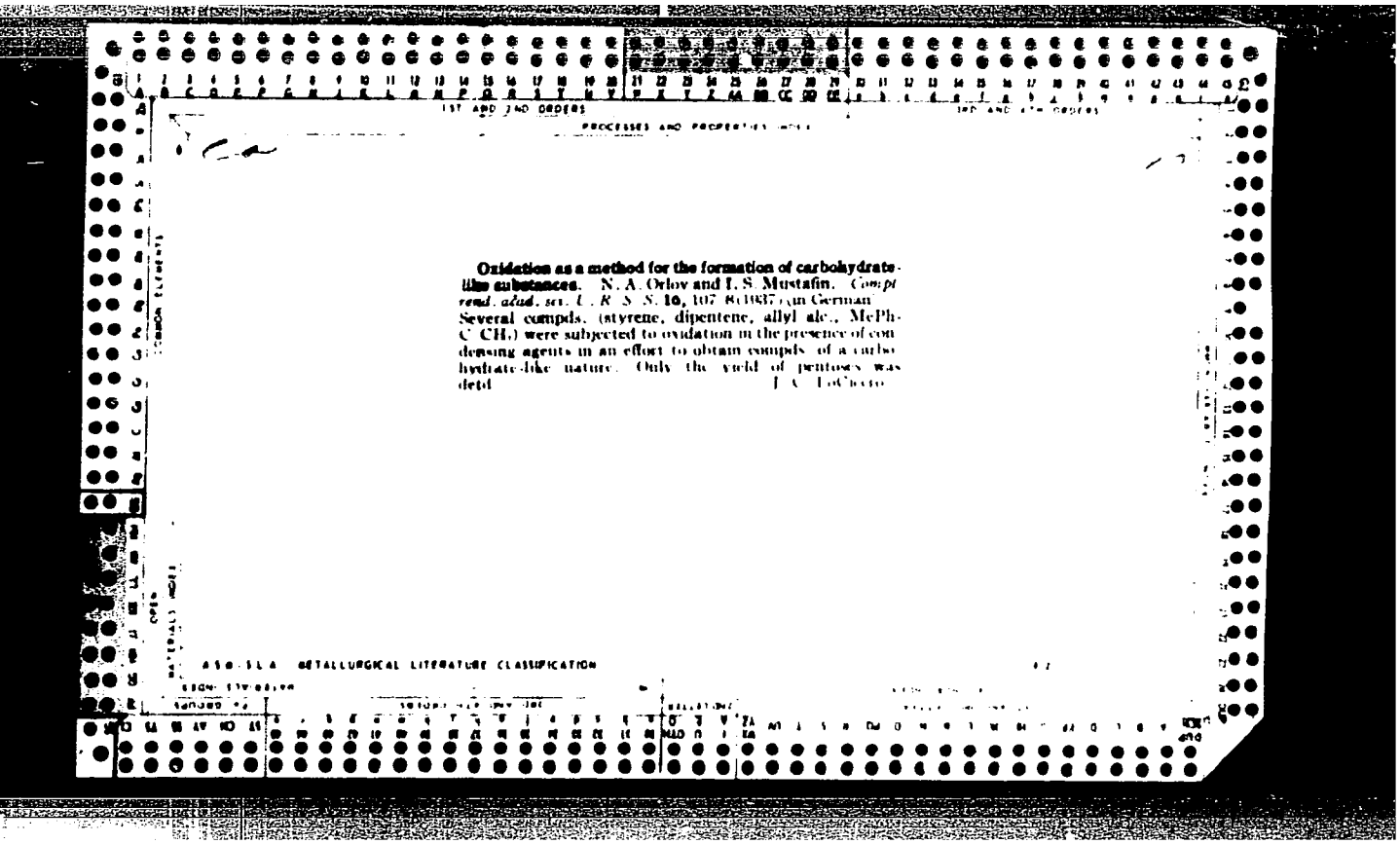
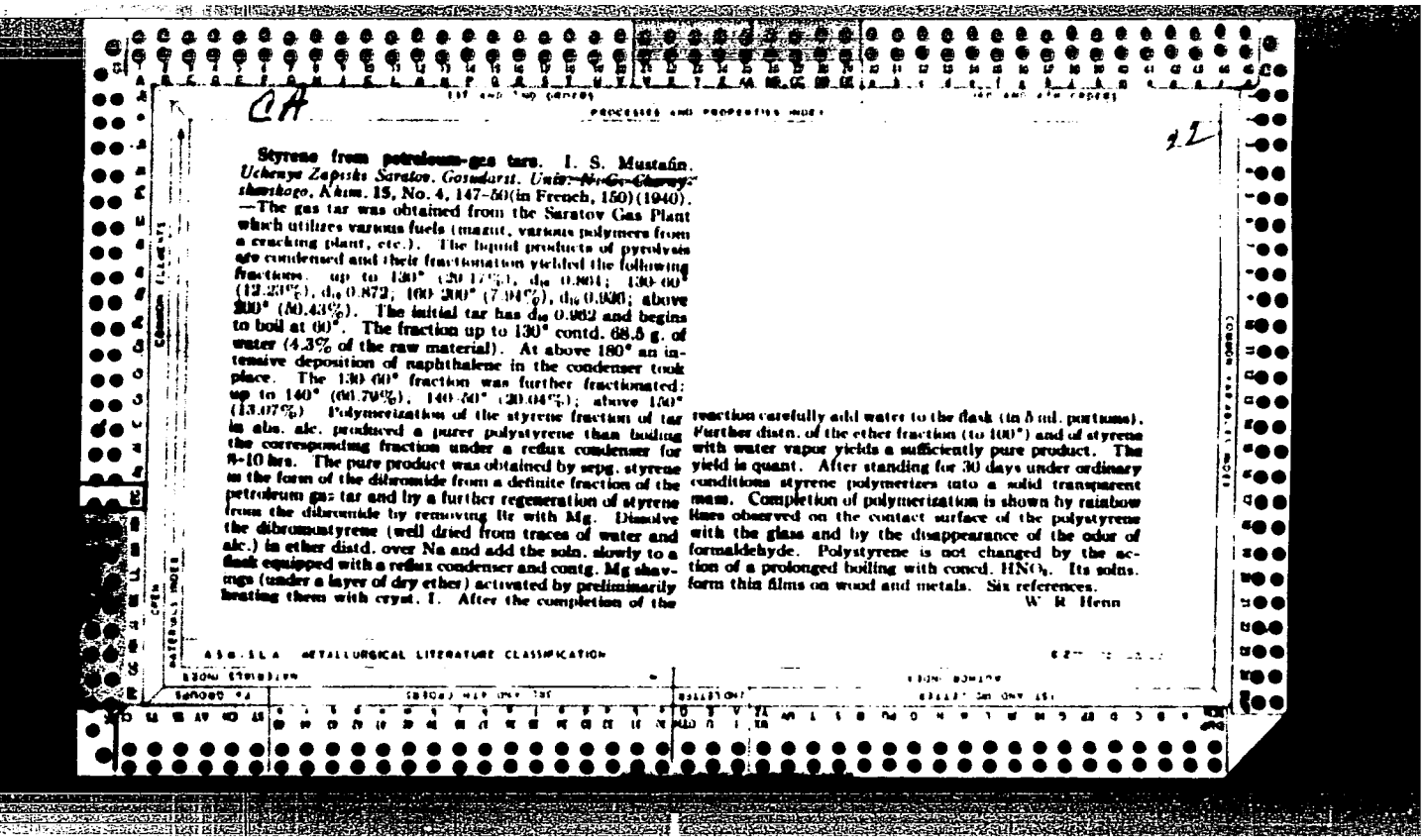
**Mellitic acid** N. A. Orlov and I. S. Mustafin. Khim. Tverdogo Topliva 7, 877 (1936). Mellitic acid, heated with BaCl for 6 hrs., yielded glassy crystals of its trianhydride, having C 80 and O 50%, i. e., $C_{12}O_9$. The anhydride is hygroscopic, stable, and can be dried at 160° without change. It is not sol. in cold water, but upon heating takes up 3 mols. of water. The anhydride reacts with naphthalene, anthracene, phenanthrene and veratrole, yielding orange-red, dark blue, brown-red and light brown crystals, resp. In all cases the mol. relation of the components of the above products was 1 : 1 as shown by the titration with an alkali. Color reactions of mellitic acid trianhydride with 63 org. substances are tabulated. The application of the anhydride for the anal. org. chemistry is suggested. A review of the literature on mellitic acid from 1799 up to the present time. Seventy-three references.

A. A. Podgorny

A 44 U.S.A. METALLURGICAL LITERATURE CLASSIFICATION



**Oxidation as a method for the formation of carbohydrate-like substances.** N. A. Orlov and I. S. Mustafin. *Compt rend. acad. sci. U. R. S. S.* **16**, 107-8(1937) (in German). Several compds. (styrene, dipentene, allyl alc., $MePh\cdot CH_2$) were subjected to oxidation in the presence of condensing agents in an effort to obtain compds. of a carbohydrate-like nature. Only the yield of pentoses was detd. J. C. LaCherie



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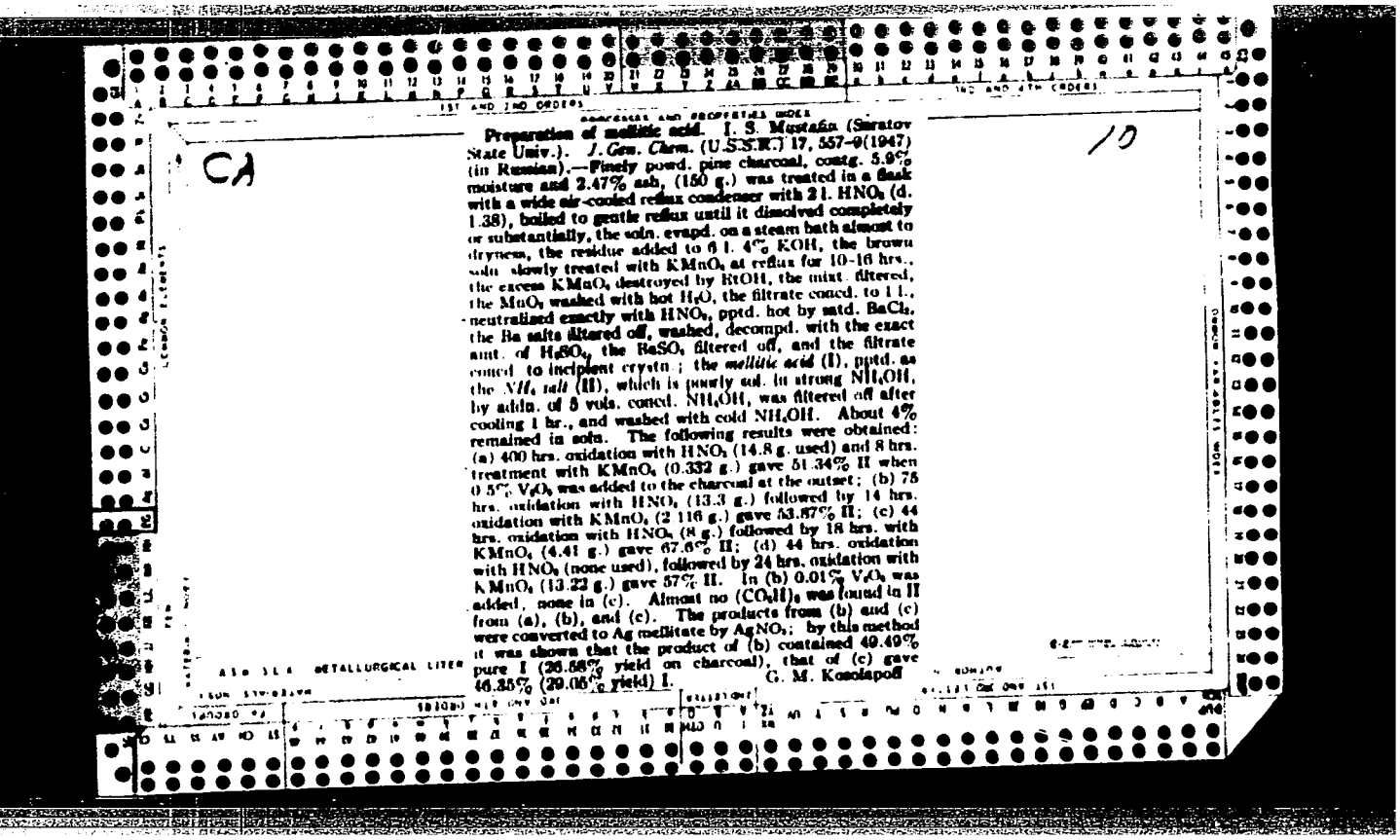
**Styrene from petroleum-gas tars.** I. S. Mustafin. *Uchenye Zapiski Saratov. Gosudarst. Univ. im. N. G. Chernyshevskogo, Khim.* 15, No. 4, 147–50(in French, 150)(1940). —The gas tar was obtained from the Saratov Gas Plant which utilizes various fuels (mazut, various polymers from a cracking plant, etc.). The liquid products of pyrolysis are condensed and their fractionation yielded the following fractions: up to 130° (20.17%), $d_0$ 0.804; 130–60° (12.23%), $d_0$ 0.872; 160–200° (7.94%), $d_0$ 0.930; above 200° (59.43%). The initial tar has $d_0$ 0.982 and begins to boil at 60°. The fraction up to 130° contd. 68.5 g. of water (4.3% of the raw material). At above 180° an intensive deposition of naphthalene in the condenser took place. The 130–60° fraction was further fractionated: up to 140° (60.70%), 140–50° (20.04%); above 150° (13.07%). Polymerization of the styrene fraction of tar in abs. alc. produced a purer polystyrene than boiling the corresponding fraction under a reflux condenser for 9–10 hrs. The pure product was obtained by srpg. styrene in the form of the dibromide from a definite fraction of the petroleum gas tar and by a further regeneration of styrene from the dibromide by removing Br with Mg. Dissolve the dibromstyrene (well dried from traces of water and alc.) in ether distd. over Na and add the soln. slowly to a flask equipped with a reflux condenser and contg. Mg shavings (under a layer of dry ether) activated by preliminarily heating them with cryst. I. After the completion of the reaction carefully add water to the flask (in 5 ml. portions). Further distn. of the ether fraction (to 100°) and of styrene with water vapor yields a sufficiently pure product. The yield is quant. After standing for 30 days under ordinary conditions styrene polymerizes into a solid transparent mass. Completion of polymerization is shown by rainbow lines observed on the contact surface of the polystyrene with the glass and by the disappearance of the odor of formaldehyde. Polystyrene is not changed by the action of a prolonged boiling with concd. $HNO_3$. Its solns. form thin films on wood and metals. Six references.

W. R. Henn



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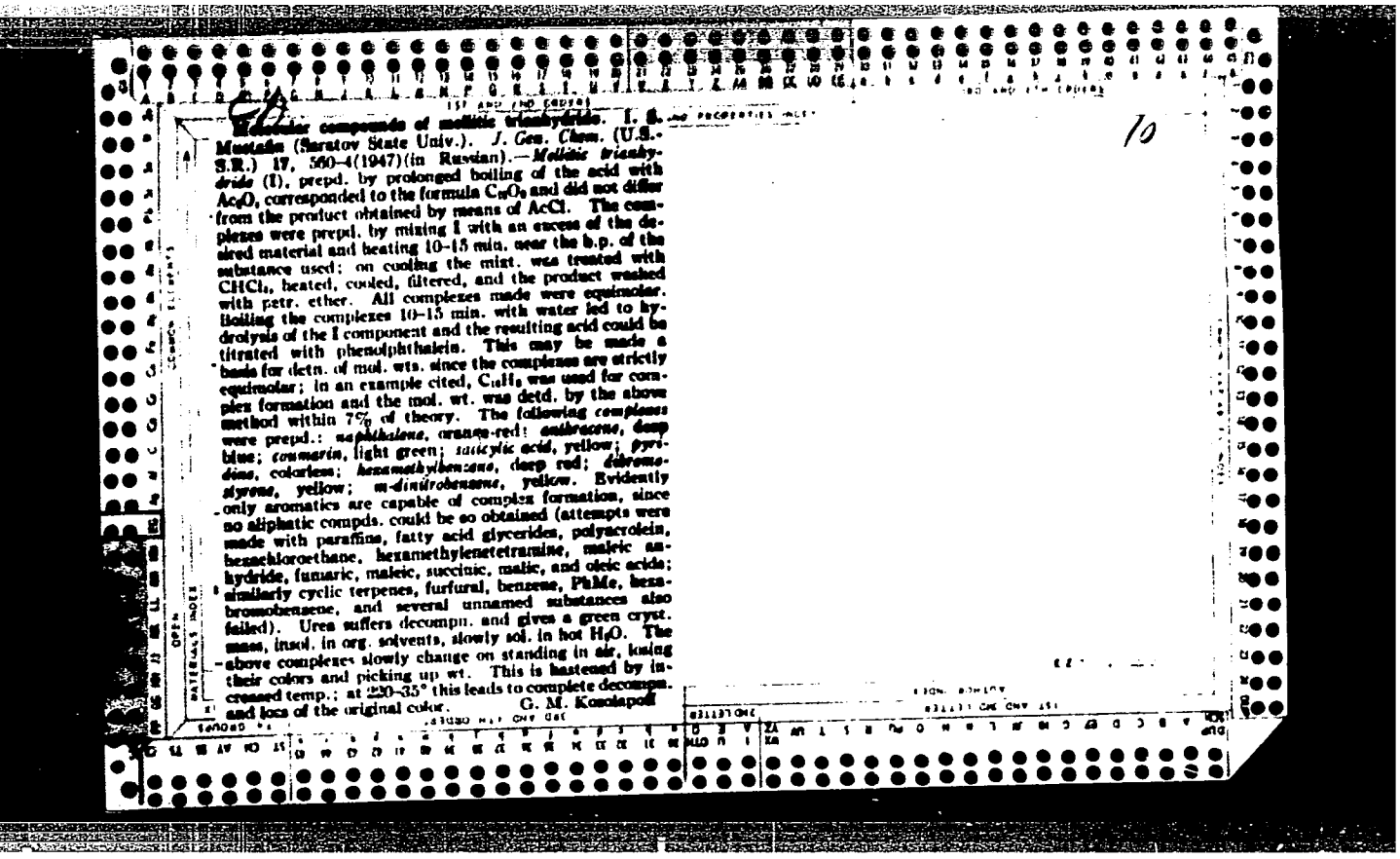
**Preparation of mellitic acid.** I. S. Mustafin (Saratov State Univ.). *J. Gen. Chem.* (U.S.S.R.) 17, 557–9(1947) (in Russian).—Finely powd. pine charcoal, contg. 5.9% moisture and 2.47% ash, (150 g.) was treated in a flask with a wide air-cooled reflux condenser with 2 l. $HNO_3$ (d. 1.38), boiled to gentle reflux until it dissolved completely or substantially, the soln. evapd. on a steam bath almost to dryness, the residue added to 6 l. 4% KOH, the brown soln. slowly treated with $KMnO_4$ at reflux for 10–16 hrs., the excess $KMnO_4$ destroyed by EtOH, the mixt. filtered, the $MnO_2$ washed with hot $H_2O$, the filtrate concd. to 1 l., neutralized exactly with $HNO_3$, ppted. hot by satd. $BaCl_2$, the Ba salts filtered off, washed, decompd. with the exact amt. of $H_2SO_4$, the $BaSO_4$ filtered off, and the filtrate concd. to incipient crystn.; the *mellitic acid* (I), ppted. as the *NH₄ salt* (II), which is poorly sol. in strong $NH_4OH$, by addn. of 5 vols. concd. $NH_4OH$, was filtered off after cooling 1 hr., and washed with cold $NH_4OH$. About 4% remained in soln. The following results were obtained: (a) 400 hrs. oxidation with $HNO_3$ (14.8 g. used) and 8 hrs. treatment with $KMnO_4$ (0.332 g.) gave 51.34% II when 0.5% $V_2O_5$ was added to the charcoal at the outset; (b) 75 hrs. oxidation with $HNO_3$ (13.3 g.) followed by 14 hrs. oxidation with $KMnO_4$ (2.116 g.) gave 53.87% II; (c) 44 hrs. oxidation with $HNO_3$ (8 g.) followed by 18 hrs. with $KMnO_4$ (4.41 g.) gave 67.6% II; (d) 44 hrs. oxidation with $HNO_3$ (none used), followed by 24 hrs. oxidation with $KMnO_4$ (13.22 g.) gave 57% II. In (b) 0.01% $V_2O_5$ was added, none in (c). Almost no $(CO_2H)_2$ was found in II from (a), (b), and (c). The products from (b) and (c) were converted to Ag mellitate by $AgNO_3$; by this method it was shown that the product of (b) contained 49.49% pure I (26.58% yield on charcoal), that of (c) gave 46.35% (29.05% yield) I.

G. M. Kosolapoff



Molecular compounds of mellitic trianhydride. I. S. Mustafin (Saratov State Univ.). *J. Gen. Chem.* (U.S.S.R.) 17, 560–4(1947)(in Russian).—*Mellitic trianhydride* (I), prepd. by prolonged boiling of the acid with $Ac_2O$, corresponded to the formula $C_{12}O_9$ and did not differ from the product obtained by means of AcCl. The complexes were prepd. by mixing I with an excess of the desired material and heating 10–15 min. near the b.p. of the substance used; on cooling the mixt. was treated with $CHCl_3$, heated, cooled, filtered, and the product washed with petr. ether. All complexes made were equimolar. Boiling the complexes 10–15 min. with water led to hydrolysis of the I component and the resulting acid could be titrated with phenolphthalein. This may be made a basis for detn. of mol. wts. since the complexes are strictly equimolar; in an example cited, $C_{14}H_{10}$ was used for complex formation and the mol. wt. was detd. by the above method within 7% of theory. The following *complexes* were prepd.: *naphthalene*, orange-red; *anthracene*, deep blue; *coumarin*, light green; *salicylic acid*, yellow; *pyridine*, colorless; *hexamethylbenzene*, deep red; *dibromostyrene*, yellow; *m-dinitrobenzene*, yellow. Evidently only aromatics are capable of complex formation, since no aliphatic compds. could be so obtained (attempts were made with paraffins, fatty acid glycerides, polyacrolein, hexachloroethane, hexamethylenetetramine, maleic anhydride, fumaric, maleic, succinic, malic, and oleic acids; similarly cyclic terpenes, furfural, benzene, PhMe, hexabromobenzene, and several unnamed substances also failed). Urea suffers decompn. and gives a green cryst. mass, insol. in org. solvents, slowly sol. in hot $H_2O$. The above complexes slowly change on standing in air, losing their colors and picking up wt. This is hastened by increased temp.; at 220–35° this leads to complete decompn. and loss of the original color.

G. M. Kosolapoff

MUSTAFIN, I. S.

Geological Prospecting
Petroleum
Petrology

May 1948

"The Problem of the Genesis of Sulfurous Oils," I.S. Mustafin, Saratov State U imeni N.G. Chernyshevskiy, 2 pp

"Dok Ak Nauk SSSR, Nov Ser" Vol LX, No 6

Marked crude oil concentrations are found in the Cenozoic, and Paleozoic layers. Author states that there is proportional amount of coal and crude oil in the world. Presents facts and figures that support this contention. Died in Feb this, he discusses one of the problems inherent to the question of the genesis of sulfurous crude oils. Submitted by Academician S.I. Mironov 27 Mar 1948.

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MUSTAFIN, I. S.

(1)

**"New Highly Specific Spot Reaction for the Detection of Aluminium.** L. M. Kul'berg and I. S. Mustafin (*Doklady Akad. Nauk S.S.S.R.*, 1951, 77, (2), 285–288).—[In Russian]. K. and M. studied a series of α-hydroxyanthraquinones as reagents for detecting Al. 5 : 8-dichlorquinizarin seemed especially interesting; if a few drops of a saturated alcoholic soln. of this reagent are added to 1–2 ml. of an almost neutral test soln. contg. $Al^{3+}$, the colour of the soln. changes on boiling from yellow-green to bright rose (an orange-rose fluorescence in ultra-violet light). The colour and fluorescence do not change on adding conc. HCl unless the acidified soln. is then boiled. However, the coloration is not obtained on adding the reagent to acid soln. of Al. The sensitivity is given as 0·5 γ $Al^{3+}$ at a limiting dilution of 1 : 2,000,000 (0·1 γ $Al^{3+}$ at a limiting dilution of 1 : 10,000,000). The test may also be carried out as a fluorescent spot test on filter-paper, and the sensitivity is then 0·002 g. Al at a limiting dilution of 1 : 1,000,000. Cu, Be, Zr, Th, U, and $Fe^{3+}$ also react with the reagent in neutral soln., but except in the case of $Fe^{3+}$ the colorations are removed on adding HCl. For detecting $Al^{3+}$ in the presence of $Be^{2+}$, $Th^{4+}$, or $Cu^{2+}$, the test soln. is heated with a few drops of reagent and a little chalk, cooled, and acidified: <0·1% $Al^{3+}$ can be detected in the salts of Be or Th, <0·5% Al in Cu. In the presence of large amounts of Fe, the reaction mixture must be diluted 5–10 times and a control test made with a soln. of pure Fe salt; 1% Al in Fe can be detected. Metals which do not interfere are listed.—G. V. E. T.

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MUSTAFIN, I. S.

Chemical Abst.
Vol. 48 No: 8
Apr. 25, 1954
Analytical Chemistry

(3) Chem. J. Zaire

Specific reactions and methods in organic analysis. XV. Detection and determination of traces of phosphine in the presence of pyridine. L. M. Kogerman and I. S. Mustafin (Chernyshevskii Saratov State Univ.). J. Anal. Chem. (U.S.S.R.) 7, 97-101(1952)(Engl. translation).—See C.A. 47, 1545e. H. L. H.

9-2-54 GJP

MUSTAFIN, I. S.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
Analytical Chemistry

Analytical utilization of the phenomenon of halochromism. I. Reaction of some dyes with antimony trichloride. V. M. Kul'berg, I. S. Mustafin, and A. I. Cherkesov (State Univ., Saratov). *Uchenye Zapiski Khim. Fakul'teta* 18, 041-6(1952) (in Russian).—The color resulting from the reaction of $SbCl_3$ with Sudan III is caused by the formation of a halochromic substance, an adduct of the components. Other azo dyes and phthaleins are capable of similar reactions. The Sudan III-$SbCl_3$ complex dissoc. noticeably at elevated temp. until its abs. max. almost coincides with that of the initial dye. The abs. spectrum of the complex is coincident with that of Sudan III in $H_2SO_4$. Thymolphthalein can be used to detect $SbCl_3$ on the basis of this reaction, performed by mixing the ingredients in $CHCl_3$, which forms a red color band on the vessel walls in the presence of $SbCl_3$; the color is destroyed by moisture. The time of emergence of color is a rough measure of the concn. of $SbCl_3$, down to 0.006%. G. M. Kosolapoff

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9-17-54

MUSTAFIN I. S. 238T9

USSR/Chemistry - Bismuth Aug 52

"The Charging Effect," L. M. Kul'bert, I. S. Mustafin and N. K. Kochetkov, Saratov State U imeni N. G. Chernyshevskiy

"DAN SSSR" Vol 85, No 6, pp 1285-1288

The limits of applicability of the charging effect in studying the sensitivity of detection of Bi and Sb with the aid of nitrogen contg heterocyclic compds and their N-alkylates was studied. The sensitivity of such reagents under stable conditions depends on the chem nature of the charging group and its position in the mol as well as the mol wt. Presented by Acad A. N. Nesmeyanov 21 June 52

238T9

(CA 47 no.17: 8576 '53)

MUSTAFIN, I. S.

Analytical Abst.
Vol. 1 No. 3
Mar. 1954
Organic Analysis

(2) Chem

499. Use of dimedone for spot detection of aldehydes. L. M. Kulberg and I. S. Mustafin (*U. Anal. Chem., U.S.S.R.*, 1953, 8 [2], 122–126).—Use is made of the acidic character of the enol compound formed in the dimedone reaction with aldehydes. The test is carried out on filter-paper, the acid detector being Feigl's $Ag_2CrO_4 \cdot NH_3$ reagent (*Ind. Eng. Chem., Anal. Ed.*, 1942, 14, 510). G. S. SMITH

MUSTAFIN, I. S.

USSR/Chemistry - Analytical, Beryllium Jul-Aug 53

"Polynuclear alpha-Polyhydroxyquinones as Reagents for Beryllium," I.S. Mustafin, L.M. Kul'berg, Chair of Anal Chem, Saratov State U

Ukrain Khim Zhur, Vol 19, No 4, pp 421-428.

Investigated the reactions of a number of alpha-polyhydroxyquinones with some cations. Proposed the use of 1,4,5,8-tetrahydroxy anthraquinone as a very sensitive reagent for Be. Found that this reagent is very specific, i.e. that it permits detection of Be in the presence of a great number of other ions. With the use of this reagent, Be

268T13

can be detected in technical alloys without removing shavings for analysis from the surface of the alloy tested.

268T13

MUSTAFIN, I.S.

The determination of chlorides in natural waters, salt solutions, and soils. T. I. Badeeva, V. P. Khramov, I. S. Mustafin, and L. M. Kul'berg (N. G. Chernyshevskii State Univ., Saratov). *Gidrokhim. Materialy, Akad. Nauk S.S.S.R.* 21, 139–43(1953).—The use of 2-nitroso-1-naphthol as an indicator is recommended in detg. Cl by the mercurometric method. An intensive red color appears. This is ascribed to the formation of the 2-nitroso-1-naphthalate of Hg. J. S. Joffe

MUSTAFIN, I. S.

"Data on the Theory of the Action of Organic Reagents. (The Development of Intramolecular Reaction Between Atoms and Groups by Using Organic Compounds as Analytical Reagents)." Dr Chem Sci, Moscow State U, Saratov State U, Moscow, 1954. (RZhKhim, No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)

SO: SUM No. 556, 24 Jun 55

MUSTAFIN, I. S.

USSR/ Chemistry - Analytical chemistry

Card 1/1 Pub. 116 - 20/30

Authors : Mustafin, I. S.; Badeyeva, T. I.; and Kul'berg, L. M.

Title : The value of steric factors during the utilization of organic compounds in the role of analytical reagents

Periodical : Ukr. khim. zhur. 21/3, 381-383, June 1955

Abstract : Scientific explanation is given on the role and value of steric factors during analytical reactions of organic substances with different components. A study of numerous substances, which appeared to be necessary for the solution of certain analytical problems, showed that steric hindrances during reactions have a definite and also serious effect on the sensitivity and consequently also on the analytical value of the reagent. It is pointed out that steric factors must always be taken into consideration during the synthesis of organic reagents. Nine references: 7 USSR and 2 German (1913-1953).

Institution : The N. G. Chernishevskiy State Univ., Faculty of Anal. Chem., Saratov

Submitted : October 1, 1954

MUSTAFIN, I. S.

6 6 8

Effect of the methyl group on the properties of organic reagents. L. M. Kul'berg, T. I. Nadeeva, and I. S. Mustafin (N. G. Chernyshevskii State Univ., Saratov). *Ukrain. Khim. Zhur.* 21, 641–5(1955)(in Russian).—The effect of the $CH_3$ group was studied in the ortho and para position to functional analytically active groups in mols. of org. reagents. Some of the reagents considered were tetramethyl-*o*-tolidine and tetramethylbenzidine, Ethyl Violet and its trimethyl analog, salicylic acid and *o*-cresotic acid, and *o*-totylanthranilic and phenylanthranilic acids. $CH_3$ in the ortho position to a dimethylamino group reduced the sensitivity of the reaction, whereas in the same position to an amino and some other groups it raised the sensitivity in some cases. In the para position $CH_3$ had no significant effect. The effect of $CH_3$ on the sensitivity of org. reagents is attributed to steric factors. M. Hosch

CH (2)

Mustafin, I. S.

USSR/ Chemistry - Analytical chemistry

Card 1/1 Pub. 116 - 18/29

Authors : Kul'berg, L. M.; Molot, L. A.; and Mustafin, I. S.

Title : Effect of internal hydrogen bond on the properties of organic analytical reagents

Periodical : Ukr. khim. zhur. 21/6, 766-772, Dec 1955

Abstract : Experiments were conducted with various organic analytical reagents to determine the effect of an internal hydrogen bond on their characteristics. An analysis of results shows that the presence of an internal hydrogen bond in a molecule of analytical form leads to a considerable increase in the sensitivity of the reaction resulting in the formation of intracomplex salts. Nine references: 8 USSR and 1 USA (1937-1952). Tables.

Institution : Saratov State University, Dept. of Anal. Chem.

Submitted : July 5, 1955

Category: USSR / Physical Chemistry - Molecule. Chemical bond. B-4

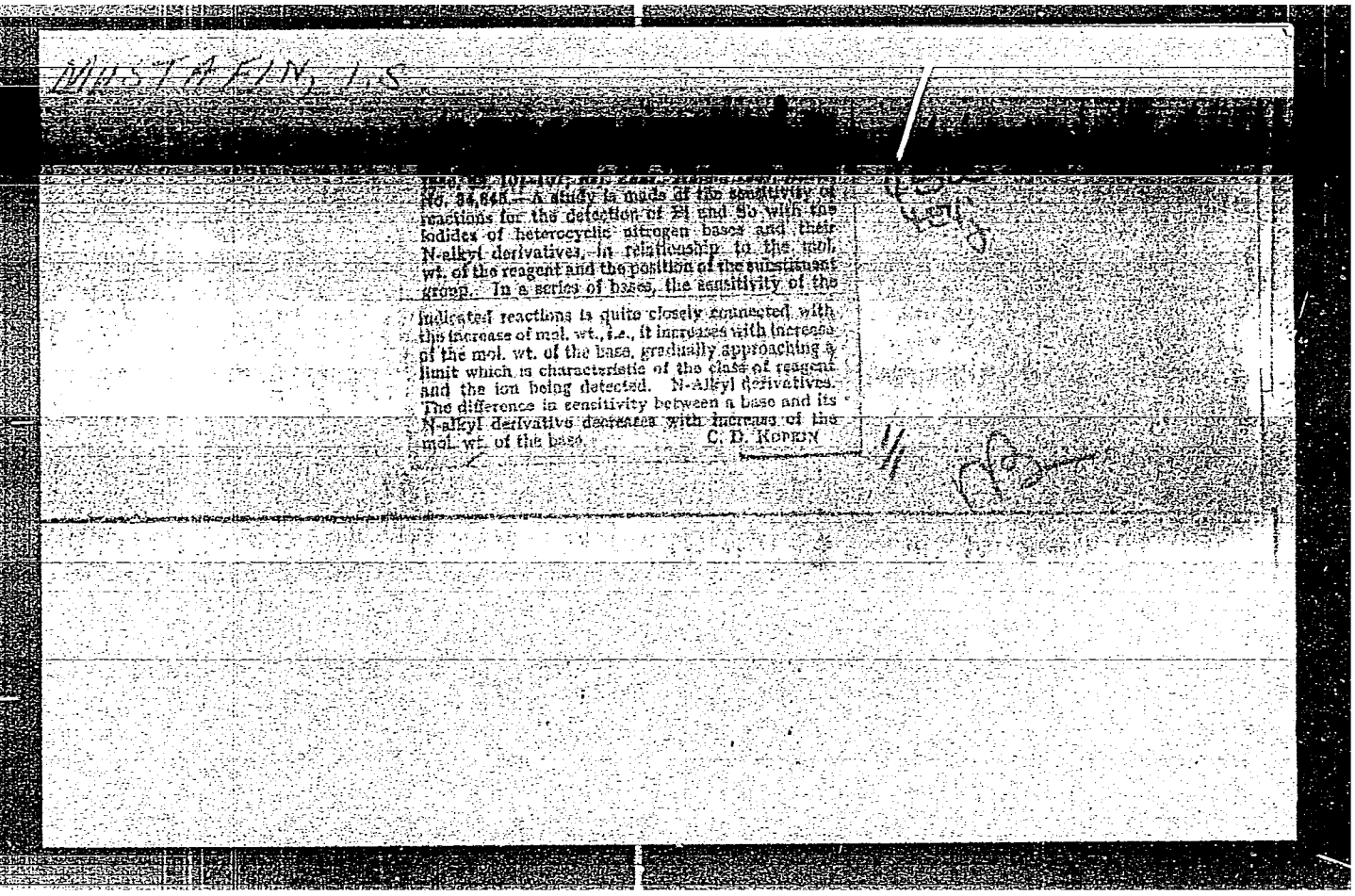
Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 29586

Author : Mustafin I. S., Kashkovskaya Ye. A.
Inst : not given
Title : Contribution to the Problem of Quantitative Characterization of Auxochromic Action of Elements (Cathions)

Orig Pub: Zh. obshch. khimii, 1956, 26, No 9, 2381-2384

Abstract: Investigation of optical properties of complexes which are the products of interaction of $VO^{2+}$, $UO_2^{2+}$, $Fe^{3+}$ and $Cu^{2+}$ with aluminone, alizarin S, carminic and hydroxy-aurine tricarboxylic acids; $\lambda$ (max) and $\varepsilon$ (mole) are given. It was found that the ratio of $\varepsilon$ (mole) of the products of interaction of two cathions with a given reagent coincides with the ratio of $\varepsilon$ (mole) of the same cathions with other reagents. This makes it possible to evaluate, quantitatively, the chromophoric action of these cathions and to arrange them into the following series: $Fe^{3+}$ $VO^{2+}$ $Cu^{2+}$ $UO_2^{2+}$, and also to predict with a certain degree of certainty the sensitivity of some colorimetric reactions.

Card : 1/1 -14-



No. 24,648.—A study is made of the sensitivity of reactions for the detection of Zr and Sb with the iodides of heterocyclic nitrogen bases and their N-alkyl derivatives, in relationship to the mol. wt. of the reagent and the position of the substituent group. In a series of bases, the sensitivity of the indicated reactions is quite closely connected with the increase of mol. wt., i.e., it increases with increase of the mol. wt. of the base, gradually approaching a limit which is characteristic of the class of reagent and the ion being detected. N-Alkyl derivatives. The difference in sensitivity between a base and its N-alkyl derivative decreases with increase of the mol. wt. of the base.

C. D. KOPPEN

MUSTAFIN, I. S.

1-4E4's
1-4E3d
1-4E2c

A new group of complexometric indicators. I. S. Mustafin and B. A. Kashkovskaya (N. G. Chernyshevskii Univ., Saratov). *Zavodskaya Lab.* 23, 510–22(1957).—The chromoxane dyes of the phenol carboxylic acids of the triphenylmethane series (Styunkel, *et al.*, *C.A.* 47, 10407b) interact in an alk. soln. with Mg, Ca, $Ni^{++}$, $Co^{++}$, $Mn^{++}$, $Cd^{++}$, $Ce^{++}$, $Zn^{++}$, and $Cu^{++}$, in acid solns. with $Ti^{++}$, $Th^{++}$, $Al^{++}$, $UO_2^{++}$, $Cr^{++}$, $V^{++}$, and $Fe^{++}$, and in a neutral soln. with $Be^{++}$. The applications of these reactions to analysis were studied at definite pH values for each cation. These dyes can be used in Trilon B titration of Mg, Ca, Ni, Th, Cu, and $VO^{++}$ ions because their complexes are completely destroyed by Trilon B, with a regeneration of the dye color. A table of optimum pH values for the titration of 0.01*N* salt solns. was prepd. Chromoxane Green GG dye ("Chromgreen") is particularly valuable. It is a brown powder, readily sol. in $H_2O$ and alc., forming green solns. It can be used as a pH indicator, and was red at pH 1–6, brown at pH 6–7, and bright green at 7–11. It is highly sensitive to Mg ions at pH 7–11 ($25 \times 10^{-4}$ g./ml.), and much less sensitive to $Ca^{++}$ at pH 11 (0.05 g./ml.). When both ions were present the indicator color changed only after both ions were combined. Mg can be accurately detd. in the presence of satd. solns. of NaCl, $Na_2SO_4$, and their mixts. The new indicator changed color much more sharply than Eriochrome Black T and Acid Chrome Blue K, as shown in results on $H_2O$ hardness detns. W. M. Sternberg

AUTHOR MUSTAFIN I.S., MATVEYEV L.O., KASHOVSKAYA Ye.A. PA - 3158

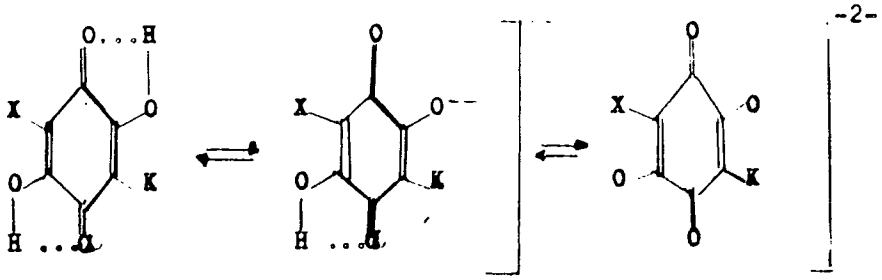
TITLE On the question of how the colour of organic compounds is affected by their internal hydrogen bonds.
(K voprosu o vliyanii vnutrennykh vodorodnykh svyazey na okrasku organicheskikh soyedineniy.- Russian)

PERIODICAL Doklady Akademii Nauk SSSR 1957, Vol 113, Nr 3, pp 610-613 (U.S.S.R.)

Received: 6/1957 Reviewed: 8/1957

ABSTRACT On the basis of the comparison and analysis of all available data the authors came to the conclusion that the dissociation of halide aniline acids is to be represented by the following scheme:





colored colorless

CARD 1/3

On the question of how the colour of organic compounds is affected by their internal hydrogen bonds.

The conception concerning innermolecular hydrogen compounds gives an idea how to understand the optimum properties of the solutions of halide anile acids. On the basis of the above scheme the following may be said:

1) When solutions of halide anile acids are diluted their optical density must diminish more rapidly than follows from the computation carried out on the basis of the concentration of the dissolved substances.

2) An addition of strong mineral acids leads to an increase of the intensity of the coloring of solutions; whereas an addition of bases leads to a considerable decrease.

3) The soluble salts of these acids must give the solutions the same color as the acid.

4) The molar coefficients for the extinction of the acids must be greater in the absorption maximum than those of the soluble salts.

5) If substances are added to the acids which mix easily with water and have small dielectric constants, this must lead to an increase of the coloring intensity of the solutions.

All these conclusions agree fully with experimental results.

PA - 3158

On the question of how the colour of organic compounds is affected by their internal hydrogen bonds.

The follows a description of these experiments.
(With 1 Illustration and 6 citations from Slavic publications.)

ASSOCIATION: State University "N.G. CHERNYSHEVSKIY" of Saratov.
(Saratovskiy gosudarstvennyy universitet im. N.G. Chernishevskogo.)
PRESENTED BY: I.N. Nazarov, Member of Academy, 20.11. 1957.
SUBMITTED: 27.9. 1956.
AVAILABLE: Library of Congress.

CARD 3/3

AUTHORS: [illegible]

TITLE: [illegible] Rapid Determination of Calcium and Magnesium in Rocks (Uskorennoye opredeleniye kal'tsiya i magniya v gornykh porodakh)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 2, pp. 297-299 (USSR)

ABSTRACT: The chromium-green-G (Khrom zelenyy G) dye is used as complexometric indicator (Ref 1), since it forms dyed analytical forms with some ions at different pH-values. Those all forms a water-soluble red compound with magnesium at pH = 11, whereas the solution of the dye itself is emerald-green in the case of the afore-mentioned acidity. The interaction with calcium is analogous, however, less sensitive. The authors give the results obtained by the method for rocks and minerals referred to in Ref 1, 2a. The whole scheme in this case is based on the fact that the amount of the calcium- and magnesium-oxides is complexometrically determined according to the deposition of the sesquioxides; Calcium-oxide is determined by means of titration

Card 1/3

Analytical Use of Phenol-Carboxylic Acids of the Triphenylmethane
Accelerated Determination of Calcium and Magnesium in Rocks

[illegible] of manganese. Table [illegible] that the results obtained by the afore-mentioned method agree with those obtained by the usual method. Table 2 shows satisfactory [illegible] some determinations in rocks and minerals although [illegible] of the objects contained a considerable [illegible] which [illegible] independent with respect to the used [illegible] method [illegible] large quantities of [illegible] makes the titration of calcium and magnesium [illegible] of chrome-green-C difficult and uncertain. [illegible] at first be separated [illegible] the determination of [illegible] means of the "addi[illegible]" method is described. In connection [illegible] Ca and Mg [illegible] 2 references.

[illegible] Institute of Silicate Chemistry Academy of Sciences [illegible] Chemistry

SOV/156-58-1-[illegible]/49

Analytical Use of Phenol-Carboxylic Acids of the Triphenylmethane-Series. Accelerated Determination of Calcium and Magnesium in Rocks

SUBMITTED: November 1, 1957

Card 3/3

KAS..KOVSKAYA, Ye.A.; MUSTAFI , T. .; NAPOL'SKII, M.Z.

Spectrophotometric [illegible] of vanadium traces by means of aluminon. Uch. za. [illegible] inst. no.11:150-157 '58. (MIA 14:2)

1. Kafedra khimii Kuy[illegible]tvennogo pedagogicheskogo instituta.
(Vanadium--Spectra) (Aluminon)

AUTHORS: Mustafin, I. S., [illegible] 20-15-[illegible]/[illegible]

TITLE: Analytical Application of Chromotropic Acid. 2. The Triphenyl Methane Dyes (Analiticheskoye primeneniye khromotropovoy kisloty. 2. Ob trifenilmetanovykh krasitelyakh)

PERIODICAL: [illegible], 1[illegible], Vol 1[illegible], [illegible], [illegible] (USSR)

ABSTRACT: In a previous communication (reference 1) the authors showed that the qualitative detection-reaction, developed by V. I. Kuznetsov (references 2,3), for the vanadyl ion with the use of Aluminon can also serve for the photometric determination of vanadium in solutions without foreign ions. The reaction of the vanadyl ion with aluminon is marked by a high sensitivity and quick progress. It is applicable in a wide concentration range. the solution of the reaction product obeying the Lambert-Beer law. A great advantage is also represented by the

Card 1/4

Analytical Application of phenolcarbonic Acids of the Triphenylmethane Series [illegible] of Vanadium in Steels with the Use of Alumin[illegible]

[illegible] easy accessibility of the reagent [illegible] examined this reaction [illegible] colorimetric determination method [illegible] vanadium in steels. Aluminon is not a specific reagent for vanadium. The specifity of the reaction on vanadium can be increased by a regulation of the [illegible] concentration, because aluminon as well as other organic reagents react with different elements only in certain $p_H$ ranges. The investigations showed that most of the foreign ions react at lower $p_H$-values with aluminon than the vanadium ions. Thus the alkaline and earth-alkaline metals, further $Mn^{2+}$, $Zn^{2+}$, $Fe^{3+}$, $Ni^{2+}$, $Co^{2+}$, As(V), U(VI), $HfO^{2+}$ and $Hg^{2+}$ do not disturb the determination of vanadium by aluminon. $Al^{3+}$, $Fe^{3+}$, $Cr^{3+}$, $Cu^{2+}$, $Be^{2+}$, Th(IV), Ce(III), Ti(IV) and $UO_2^{2+}$, on the

Card 2/4 contrary form colored compounds with the reagent in the

same $p_H$-range, which also is favorable for the determination of vanadium. Therefore the disturbing influence of these elements, which usually occur in steel as associates of vanadium, must be removed. For the masking of iron and chromium the authors used thioglycolic acid. This forms a light-green colored complex with trivalent chromium (References 1c,11), the color of which in case of heating with an acetate buffer ($p_H$ 3,4 - 3,9) becomes still considerably more pale. As experiments showed thioglycolic acid practically removes the disturbing influence of any quantity of iron. Chromium does not disturb the determination of vanadium on to a 200-fold surplus in case of addition of thioglycolic acid. Thioglycolic acid is added in the determination of vanadium in form of a 2.5% solution. The order in which the reagents are added is also essential. To the test-solution first a certain quantity of thioglycolic acid is added, then the buffer solution,

Analytical Application of Phenolcarbonic Acids of the Triphenylmethane Series. Determination of Vanadium in Steels With the Use of Aluminon

75-15-2-11/27

and finally the solution of aluminon in order to prevent the thioglycolic acid from changing the $p_H$-value of the solution. It is neutralized previously with lye towards Congo red. Therefore the photocolorimetric determination of vanadium in various steel sorts is possible by means of this method without precedent separation of the disturbing ions. The performance of the determination and the analysis results for various steel types are given exactly. There are 5 tables and 11 references, 9 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. N. G. Chernyshevskogo (Saratov State University imeni N. G. Chernyshevskiy)

SUBMITTED: December 25, 1956

Card 4/4

1. Steel--Colorimetric analysis 2. Photometry--Performance
3. Vanadium--Determination 4. Hydrogen ion concentration--Control

BADEYEVA, T.I., MUSTAFIN, I.S., PETIKOVA, K.G.

Mercurimetric determination of chlorides in food products. [with summary in English]. Vop.pit. 17 no.4:69-72 Je-Ag'58 (MIRA 11:7)

1. [illegible] kafedry analiticheskoy khimii (zav. I.S. Mustafin) Sar[illegible]ogo gosudarstvennogo universiteta.

(FOOD,
chlorides, mercurimetri[illegible] (anal.)
(CHLORIDES, determination
in food, mercurimetric tech[illegible] (anal.)

AUTHORS: Mustafin, I S. Matveyev, L.O. 32-3-1/51

TITLE: Phenolcarboxylic Acids of the Triphenylmethane Series Applied for Analysis (Analiticheskoye primeneniye fenolkarbonovykh kislot trifenilmetanovogo ryada). The Determination of Beryllium in Rocks, Minerals, and Alloys (Opredeleniye berilliya v gornykh porodakh, mineralakh i splavakh)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 3, pp. 259-262 (USSR)

ABSTRACT: Among the phenolcarboxylic acids, "dichlorsulphodimethyloxyfuksondicarboxylic acid" was found to be a suitable reagent for beryllium. It is known as a coloring agent under the name "khromoksan pure blue B.A" and is called "Al'beron" in this paper. Its sodium salt was already found to be an indicator for various ions and was also recommended as a coloring reagent for beryllium. Al'beron can be used for the purpose of determining quantities of 0.025 γ/ml $Be^{2+}$, in which case its yellow color turns blue-violet. Measurements were carried out on a Pulfrich-photometer at λ = 590 mμ, with a pH of 4.4 - 4.6 being mentioned as an optimum, because trilon B which is necessary for the

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Phenolcarboxylic Acids of the Triphenylmethane Series Applied for Analysis. The Determination of Beryllium in Rocks, Minerals, and Alloys

32-3-1/52

elimination of other ions, destroys the color in the case of pH > 4.8. An analyzation process for bronze is mentioned, with which the buffer solution according to A.K. Babko [Ref.9] was produced. It was found that a melt of minerals containing beryllium with granite-like silicates and soda or soda-potash mixtures lead to simple dissolution. The accompanying ions are blocked with trilon B. Two varieties of this analysis are mentioned, and the results obtained show that the usual method and the method of the granite melt are of equal accuracy. There are 4 figures, 3 tables, and 11 references, 5 of which are Slavic.

ASSOCIATION: Saratov State University imeni N.G. Chernyshevskiy (Saratovskiy gosudarstvennyy universitet im. N.G. Chernyshevskogo)

AVAILABLE: Library of Congress

1. Rocks-Beryllium-Determination 2. Minerals-Beryllium-Determination
3. Alloys-Beryllium-Determination 4. Dichlorsulphodimethyloxy-fuksondicarboxylic 5. Acid--Application

Card 2/2

SOV/32-24-9-7/55

AUTHORS: Mustafin, I. S., Kashkovskaya, Ye. A., Ivanova, A. N.

TITLE: A New Trilonometric Indicator of the Acid Chrome Dark Blue Type (Novyy trilonometricheskiy indikator tipa kislotnogo khromtemnosinego)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 9, pp 1060-1061 (USSR)

ABSTRACT: In the study of domestic azo-dyes which might be used as indicators in trilonometric determinations, "acid monochrome blue 3" has been found to be applicable. This compound is produced by the Derbenevskiy khimicheskiy zavod (Derbenevskiy chemical works). In the presence of $Ca^{2+}$-ions and $Mg^{2+}$-ions at a pH = 8, the solutions of acid monochrome blue 3 are crimson colored. In the absence of these ions, the solution is crimson colored at a pH < 7, blue at a pH = 8 - 10, and again crimson colored at a pH > 11. From a table of the sensitivities of some azo-dyes to various cations it is apparent that acid monochrome blue 3 is most sensitive to magnesium ions. For trilonometric titrations with this indicator, a pH = 9,6 - 9,8 is recommended, as this interval will best reveal the color change. The presence of copper interferes with the determination, whereas $Fe^{3+}$ and

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A New Trilonometric Indicator of the Acid Chrome Dark Blue Type

$Al^{3+}$, in quantities up to 5 - 7 mg/l, do not interfere with it. In the presence of trilon B, $Zn^{2+}$-ions do not interfere with the measurements.
There are 2 tables.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. N. G. Chernyshevskog. (Saratov State University imeni N. G. Chernyshevskiy)

SOV/32-24-10-8/70

AUTHORS: Kashkovskaya, Ye. A., Mustafin, I. S.

TITLE: Determination of Aluminum With the Reagent "Al'beron" (Opredeleniye alyuminiya s reaktivom al'beron)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 10, pp 1189-1192 (USSR)

ABSTRACT: In previous investigations (Ref 1) it was found that the reagent "al'beron" (dichlorosulfodimethyloxyfuchsondicarboxylic acid, the dye chromoxanthine pure blue BLD) is a sensitive reagent for beryllium and aluminum, among others. A table of the dependence of the color of the compounds of several elements with this reagent on the pH is given. In the present case the possibility of applying the mentioned reagent to the determination of aluminum is investigated. The change of color from yellow to blue-violet which takes place here may be observed with aluminum quantities of 0,01 γ per ml. The measurements were carried out in the experiments with a Pulfrich (Pul'frikh) photometer. A diagram shows that the characteristic color of the reagent in the absorption maximum does not coincide with the color of the analytic

Determination of Aluminum With the Reagent "Al'beron" SOV/32-24-10-8/70

form. Acetate-ammonia solutions (Ref 2) were used in order to regulate the acidity of the medium. It was observed that the color of the complex compound is produced according to the Lambert-Beer Law within an interval of 0,5-20 γ. The limiting concentrations of other elements in the presence of which aluminum can be determined with the investigated reagent were determined as well. The results of the determinations of small aluminum quantities in the presence of greater quantities of iron and copper are given in tables. On the strength of the investigations carried out a method for determining small quantities of aluminum in iron and copper alloys was worked out. The course of the analysis is given as well as the results of several analyses of bronze- and steel samples. There are 4 figures, 3 tables, and 2 references, 2 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. N. G. Chernyshevskogo (Saratov State University imeni N.G. Chernyshevskiy)

Card 2/2

MUSTAFIN, I. S., Doc Chem Sci (diss) -- "Investigation of the analytic use of organic substances". Saratov, 1959. 29 pp (Inst of Geochem and Analyt Chem im V. I. Vernadskiy, Acad Sci USSR), 170 copies (KL, No 23, 1959, 161)

5(2) SOV/153-2-3-1/29

AUTHORS: Mustafin, I. S., Kruchkova, Ye. S.

TITLE: Indicators With Internal Light Filters. I. Determining the Hardness of Lightly Mineralized Waters Using the Indicator "Gidron 1."

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 3, pp 311-315 (USSR)

ABSTRACT: A new indicator "Gidron 1" is suggested for the trilonometric determination of hardness. It consists of two portions of 0.5 % solution of acid monochrome blue 3 in an alcohol buffer mixture of a pH of approximately 10 and 3 portions of 0.25 % aqueous solution of naphthene yellow as internal light filter. Both dyes are produced in the USSR; the authors used products of the Derbenevskiy khimicheskiy zavod (Derbenevskiy Chemical Works). The new indicator shows very high sensitivity to Mg and Ca (0.012 µg/ml), moreover, it reacts with Sr, Ba, Zn, Cu, Ni, and Co (Table 3). With magnesium and calcium the indicator forms a red complex, in titration the color turns green without intermediate colors (absorption curves in Figs 1 and 2; molar extinction coefficients for $\lambda_{max}$ in Table 2). The indicator is suited for a hardness determination on water with a

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Indicators With Internal Light Filters. I. Determining the Hardness of Lightly Mineralized Waters Using the Indicator "Gidron" SOV/153-2-3-1/29

hardness of less than 0.01 mg equivalent/l. There are 2 figures, 4 tables, and 9 references, 4 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet imeni N. G. Chernyshevskogo - Kafedra analiticheskoy khimii (Saratov State University imeni N. G. Chernyshevskiy - Chair of Analytical Chemistry)

SUBMITTED: April 29, 1958

Card 2/2

AUTHORS: Mustafin, I. S., Molot, L. A. SOV/[illegible]-2-4-5/32

TITLE: Indicators With Internal Light Filters. II. Trilonometrical Determination of Sulfates With an Indicator on the Basis of Sodium Rhodisonate

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2 , Nr 4, pp 493 - 497 (USSR)

ABSTRACT: The authors give an introductory survey and criticism of the methods of complexometrical determination of sulfates (Refs 1-18). Sodium rhodisonate, which had been suggested as a reagent for barium long ago, was also investigated as the indicator of direct and indirect determination of sulfates (Refs 1c-18). With regard to the discernibility of the normal eye, the yellow-red change in the coloring at this titration is not satisfactory. At the same time, the contrasts of this change can be increased on account of the laws of colorostatics. If blue dye, which does not change during the analytical reaction, is added to a sodium-rhodisonate solution at pH 10, the solution will turn green following the rule of color mixing. If barium ions are added, the solution will turn violet. This color change is visually more distinct than the change yellow ⇄ red. After trying

Card 1/3

Indicators With Internal Light Filters. II. Trilono- SOV/[illegible]
metrical Determination of Sulfates With an Indicator on the Basis of Sodium Rhodisonate

several blue dyes the authors chose the dye "Bluer for Caprone" (see Diagram) as internal light filter for sodium rhodisonate. Figure 1 shows its light-absorption curve at pH 10. Its character does not change in the range of pH 2-11. The sensitivity of the indicator with a light filter against barium does not differ from that of the initial rhodisonate. Practically, the indicator shows no alcohol-, salt-, and protein error. An indirect trilonometrical determination of sulfates from pure solutions can be carried out by precipitating by means of an excess of titrated barium-chloride solution at low temperatures. Table 1 shows data on a volume determination of sulfates in pure solutions with the use of an indicator with a light filter. Hence it appears that the manipulation described is satisfactory with regard to accuracy and reproducibility. Naturally, the sulfate determination is disturbed by cations which interact with rhodisonate in titration: magnesium, alkaline earths, iron, nickel, cobalt, copper, zinc, and several others. Therefore, the solution has to be cationized, if necessary. Table 2 shows the results of such an operation. V. N. Lenskaya obtained cationite, K. P. Petrikova

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Indicators With Internal Light Filters. II. Trilono- SOV/153-2-4-5/32
metrical Determination of Sulfates With an Indicator on the Basis of Sodium Rhodisonate

participated in the analytical work. The sufficient agreement of the results with those obtained by other methods proves the quality of the method described here. There are 1 figure, 2 tables, and 18 references, 6 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet, Kafedra analiticheskoy khimii ( Saratov State University, Chair of Analytical Chemistry)

SUBMITTED: May 12, 1958

Card 3/3

5 (2, 3)

AUTHOR: Mustafin, I. S. SOV/20-126-3-33/69

TITLE: Sensitivity Limit of Analytic Reagents (O predele chuvstvitel'nosti analiticheskikh reaktivov)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 3, pp 579-581 (USSR)

ABSTRACT: Although many of the reagents used at present ensure the detection of particles of a microgram of the substance required (Refs 1, 2), this sensitivity is often insufficient. This is proved by the continuous search for new reagents, and for methods of concentrating the component required. The author describes the factors involved here (Refs 3-8). In spite of the huge stock of reagents (mainly organic reagents) which increases more and more, the author raises the question whether such search can be justified in every case. For, the sensitivity of a direct detection of any substance required by means of chemical reactions must have a certain minimum value which must be strictly observed due to physical and physiological rules governing the occurrence of the analytical effect. These rules are hardly discussed in hand- or textbooks. The author brings a table (Table 1)

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characterizing the sensitivity of detection of the required substance with the use of colorimetric and precipitating reagents. The figures given present a logical argumentation of the fact that, under equal conditions, the precipitating reagents yielding colored analytic compounds prove to be more sensitive than reagents producing colorless sediments. Besides, it can be asserted on account of these figures that, for instance, the existence of a precipitating reagent capable of directly detecting lithium in concentrations below 0.05 g/ml is doubtful. The detectable minimum of uranyl ion, for example, cannot be underrated, also with the use of colorimetric reagents. The author admits that his computations are only approximate. Some important factors are not considered in them; but in spite of this, they are accurate enough for evaluating the prospects of a search for a still more sensitive reagent in every concrete case. Besides, these elementary computations give proof of the fact that the development of more efficient methods of overcoming insufficient sensitivity of highly sensitive reagents is still very interesting. There are 1 table and 12 references, 11 of which are Soviet.

Sensitivity Limit of Analytic Reagents SOV/20-126-3-33/69

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. N. G. Chernyshevskogo (Saratov State University imeni N. G. Chernyshevskiy)

PRESENTED: March 24, 1959, by A. A. Berg, Academician

SUBMITTED: March 24, 1959

Card 3/3

MUSTAFIN, I.S.; FRUMINA, M.S.

Determination of active oxygen in charged metalloceramic nickel electrodes. Zav.lab. no.4:410-412 '60.
(MIRA 13:6)

1. Saratovskiy gosudarstvennyy universitet im. Chernyshevskogo.
(Oxygen--Analysis) (Electrodes)

MUSTAFIN, I.S.; MATVEYEV, L.O.; KASHKOVSKAYA, Ye.A.

Analytical properties of hydroxyquinones. Report No. 1: Derivatives of 2,5-dihydroxy-1,4-benzoquinone. Trudy kom. anal. khim. 11:87-96 '60. (MIRA 13:10)

1. Kafedra analiticheskoy khimii i Institut geologii Saratovskogo gosudarstvennogo universiteta.
(Benzoquinone)

KASHKOVSKAYA, Ye.A.; MUSTAFIN, I.S.

Analytic properties of phenolcarboxylic acids of the triphenylmethane series. Trudy kom. anal. khim. 11:97-112 '60. (MIRA 13:10)

1. Saratovskiy gosudarstvennyy universitet im. N.G.Chernyshevskogo.
(Benzoic acid) (Methane)

MATVEYEV, L.O.; MUSTAFIN, I.S.

Photometric determination of beryllium in bronzes. Trudy kom. anal. khim. 11:217-222 '60. (MIRA 13:10)

1. Kafedra analiticheskoy khimii i Institut geologii Saratovskogo gosudarstvennogo universiteta.
(Beryllium--Analysis) (Bronze--Analysis)

MOLOT, L.A.; MUSTAFIN, I.S.; FRUMINA, N.S.

Comparison of the methods of determining trace amounts of aluminum with organic reagents. Trudy kom. anal. khim. 11:231-242 '60. (MIRA 13:10)

1. Nauchno-issledovatel'skiy institut khimii pri Saratovskom gosudarstvennom universitete.
(Aluminum--Analysis)

69049

5.2620

AUTHORS: Mustafin, I. S., Frumina, N. S.

S/078/60/005/03/011/048
B004/B002

TITLE: The Complex of Dimethyl Glyoxime With Tetravalent Nickel

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 3, pp 571-574 (USSR)

ABSTRACT: The authors give a survey of papers published in the field of structural research concerning nickel and dimethyl glyoxime compounds, and they quote A. K. Babko (Ref 3), A. S. Andreyev et al. (Ref 6), V. M. Peshkova, and N. V. Mel'chakova (Ref 7). They investigated the reaction of the hydrate of $Ni^{II}$ oxide with dimethyl glyoxime under the addition of different oxidizing agents (Table 1), determined the amount of active oxygen, and found out that the amount of iodine liberated by active oxygen, stoichiometrically corresponds to the content of $Ni^{IV}$ in the specimen (Table 2). Independently of the valence of the nickel contained in the specimen, always the same compound develops, as was shown by the light absorption curve (Fig), i.e. either by reaction of $Ni^{IV}$ contained in the specimen, or due to oxidation of $Ni^{II}$ into $Ni^{IV}$ by active oxygen contained as a solid solution in the nickel oxide concerned. The possibility of such an oxidation is confirmed by K. B. Yatsimirskiy's and Z. M. Grafova's papers (Ref 5). The authors also point at the fact that $Fe^{II}$, which also forms a soluble complex with dimethyl glyoxime,

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69049

The Complex of Dimethyl Glyoxime With Tetravalent Nickel S/078/60/005/03/011/048
B004/B002

is of the same electron structure as $Ni^{IV}$ (Table 3). Therefore they arrived at the conclusion that the red soluble complex of dimethyl glyoxime with nickel is a compound of $Ni^{IV}$. There are 1 figure, 3 tables, and 14 references, 11 of which are Soviet.

SUBMITTED: November 22, 1958

Card 2/2

5.5220

77742
SOV/75-15-1-4/29

AUTHORS: Mustafin, I. S., Kruchkova, Ye. S.

TITLE: "Hydron II", a New Indicator for Complexometric Determination of Calcium in the Presence of Magnesium

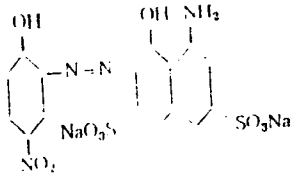
PERIODICAL: Zhurnal analyticheskoy khimii, 1960, Vol 15, Nr 1 pp 20-23 (USSR)

ABSTRACT: Preparation and use of a new indicator called "hydron II" for the complexometric determination of calcium in the presence of magnesium was studied. "Hydron II" is prepared by mixing one volume of 0.5% aqueous solution of compound (I) and 2 volumes of a 0.25% aqueous solution of naphthol yellow (II). The latter is used as an inner light filter to improve the end point. (I) is a dark brown powder, readily soluble in water, insoluble in chloroform and dioxane; in an alkaline solution (pH 12.5) it is violet blue;

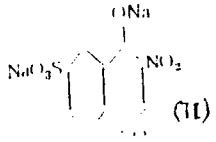
Card 1/5

77742
SOV/75-15-1-4/29

"Hydron II", a New Indicator for Complexometric Determination of Calcium in the Presence of Magnesium




(I)




(II)

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the presence of $Ca^{2+}$ produces a bright pink color. Sensitivity: 0.5 $\mu$ g-eqiv/liter $Ca^{2+}$. Mg, under the above condition, does not react with "hydron II". Results of the calcium determination by titration with 0.02N complexon (III) solution, containing 2 ml of 1N NaOH/50 ml in the presence of "hydron II" are shown in Table 1.

Table 1. Titration of Ca in the presence of Mg

| $Ca^{2+}$ Taken (mg) | Molar Ratio Ca:Mg | Found $Ca^{2+}$ |
|---|---|---|
| 3,246 | 1 : 0 | 3,246 |
| 3,246 | 1 : 0,1 | 3,253 |
| 3,246 | 1 : 1 | 3,253 |
| 3,246 | 1 : 10 | 3,258 |
| 0,325 | 1 : 100 | 0,327 |

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"Hydron II", a New Indicator for Complexometric Determination of Calcium in the Presence of Magnesium

77742
SOV/75-[illegible]/29

Interfering elements: $Ni^{2+}$, $Co^{2+}$, $Zn^{2+}$, $Cu^{2+}$, $Mn^{2+}$. Fe in concentration under 1 mg/liter does not interfere. Presence of Fe in concentrations over 100 mg/liter interferes, since brown precipitate of Fe hydroxide is formed. Determination of Ca, using "hydron II" can be carried out if 1% Mg is present. Examples of water-hardness determination using "hydron II" are shown in Table 2.

Determination of water hardness (Ca), using "hydron II" as indicator

Table 2.

| Water [illegible] | [illegible] |
|---|---|
| Tap water | 0.2302 |
| Distilled [illegible] | 0.2212 |
| [illegible] | 0.0228 |
| 5 [illegible] | 0.0054 |

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"Hydron II", a New Indicator for Complexometric Determination of Calcium in the Presence of Magnesium

77742
SOV/75-15-1-4/29

There are 2 tables; and 16 references, 4 U.S., 2 Swiss, 10 Soviet. The 4 U.S. references are: Welcher, F., The Uses of Ethylenediamine Tetra-acetic Acid, New York, 1957, p 29; Diehl, H., Ellingboe, J., Analyt. Chem., 28, (1958); Hilderbrand, H., Ch. Reilley, Analyt. Chem., 29, 258 (1957); Patton, J., Reeder, W., Analyt. Chem., 28, 1026 (1956).

SUBMITTED: December 4, 1958

Card 5/5

S/032/60/026/04/03/046
B010/B006

AUTHORS: Mustafin, I. S., Frumina N. S.

TITLE: Determination of Active Oxygen in Loaded Powder-metallurgical Nickel Electrodes

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 4, pp. 410 - 412

TEXT: A method for deposition and determination of active oxygen in powder metallurgical nickel electrodes was developed. Tartaric acid, oxalic acid, sodium arsenite, and salts of trivalent chromium were tested as reducing agents. The chromium salts applied in concentrated alkali solution at boiling point, proved most suitable. An amount of chromate equivalent to that of the nickel oxide present is formed (in 30-40 min) and determined iodometrically or by titrating with Mohr's salt using phenyl anthranilic acid as indicator. The analytical data of some powder-metallurgical electrodes are tabulated. Tests carried out with samples admixed with finely dispersed metallic nickel showed that during the analysis according to the chromate method described above no oxygen is lost (by reaction with metallic nickel). The procedure is given. There is 1 table.

Card 1/2

Determination of Active Oxygen in Loaded Powder metallurgical Nickel Electrodes

S/032/60/026/04/04[illegible]/04[illegible]
B010/B006

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. Chernyshevskogo (Saratov State University imeni Chernyshevskiy)

Card 2/2

MUSTAFIN, I.S.; NEMKOVA, N.K.

Replacing uranyl nitrate by naphthol yellow in the standard determination of oxidability of commercial ethyl alcohol. Zhur.anal. khim. 16 no.2:255 Mr-Ap '61. (MIRA 14:5)

1. Saratov State University.
(Ethyl alcohol)
(Oxidation)

KRUCHKOVA, Ye.S.; MUSTAFIN, I.S.

Complexometric determination of calcium in rocks with the hydrex II indicator. Zav.lab. 27 no.6:668-669 '61. (MIRA 14:6)

1. Saratovskiy gosudarstvennyy unifersitet imeni N.G.Chernyshevskogo.
(Calcium--Analysis)
(Indicators and test papers)

MUSTAFIN, I.S.; IVANOVA, A.N.

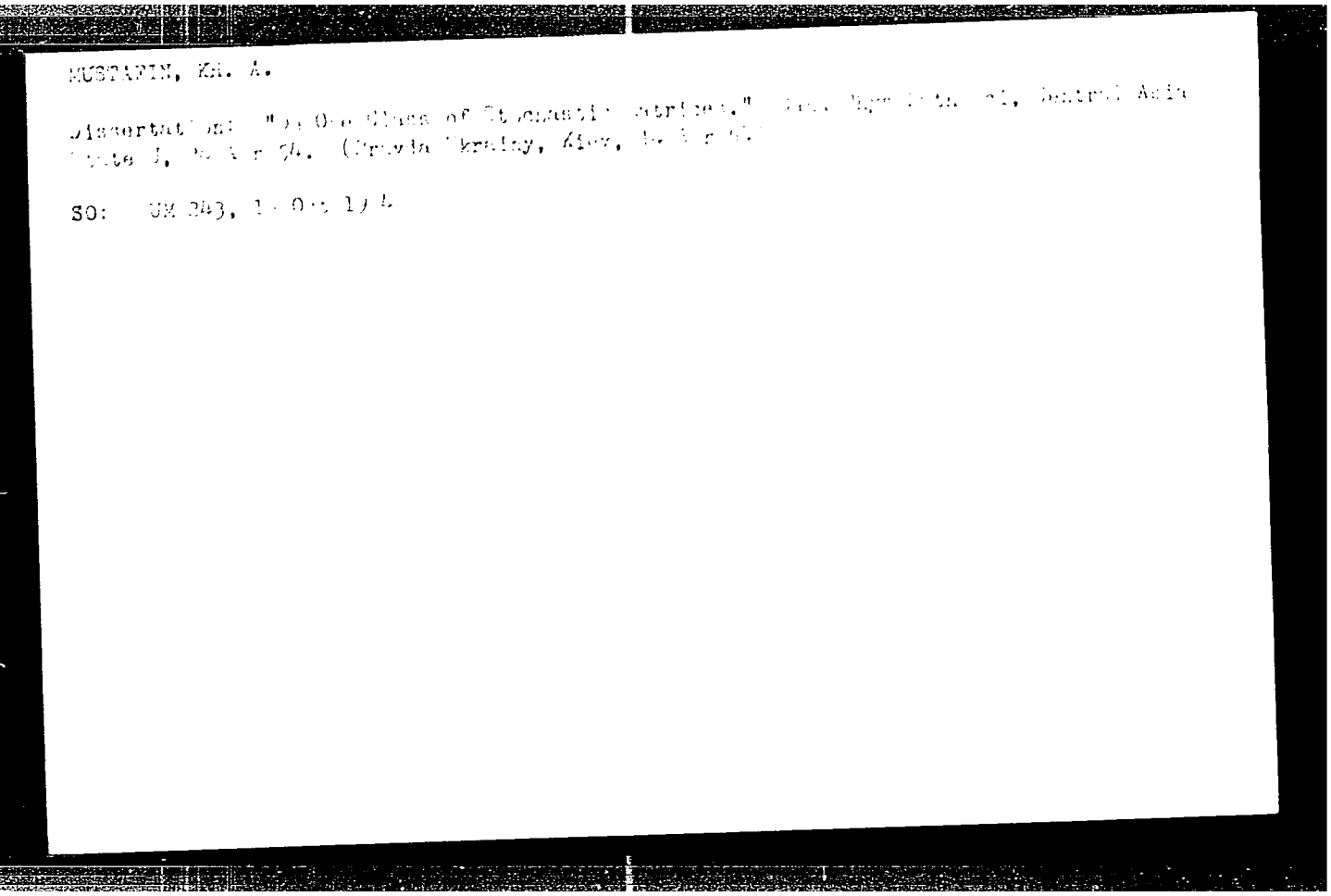
Determination of antimony trioxide in an iron cathodic mass. Izv.vys.ucheb.zav.;khim.tekh. 5 no.3:504-505 '62. (MIRA 15:7)

1. Saratovskiy gosudarstvennyy universitet imeni Chernyshevskogo, kafedra analiticheskoy khimii.
(Electrodes, Iron) (Antomony oxides)

**MUSTAFIN**, I.S.

Limit sensitivity of reagents and quantitative methods.
Zav.lab. 28 no.6:664-666 '62. (MIRA 15:5)

1. Saratovskiy gosudarstvennyy universitet imeni N.G. Chernyshevskogo.
(Chemical tests and reagents)
(Analytical chemistry—Quantitative)



MUSTAFIN, Kh. A.

Dissertation: "[illegible] Classes of Stochastic Matrices," [illegible], Central Asia [illegible], 1954. (Vestn Akademii Nauk, Alma-Ata, No 3, 1955, pp 94-96)

SO: SM 243, 1 Dec 55, 114

5.4120

68207
SOV/58-59-5-11694

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 5, p 254 (USSR)

AUTHOR: Mustafin, K.

TITLE: On the Assessment of Intermolecular Interaction in Liquids From the Absorption Spectrum of Atomic Mercury

PERIODICAL: Uch. zap. Tadzh. un-t, 1957, Vol 10, pp 133 - 137

ABSTRACT: The author surveys a series of studies devoted to the investigation of intermolecular interaction in liquids from the absorption spectra of solutions of neutral atoms (particularly mercury) in various solvents. In view of the absence of a unified point of view with regard to the nature of the double absorption band of solutions of atomic mercury in hexane, methyl alcohol, and water, the author investigated the absorption spectrum of a mercury solution in ethyl alcohol at $\sim 60^{\circ}C$ using the photographic method. The position of the Maximum was determined with an accuracy of $\pm 5$ Å. Two bands with maxima at 2,535 and 2,575 Å appear in the absorption spectrum. The distance between the

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On the Assessment of Intermolecular Interaction in Liquids From the Absorption Spectrum of Atomic Mercury

maxima agrees with the data in the literature concerning the interconnection between the magnitude of the splitting of the band and the value of the solvent's dipole moment. Adding small amounts of foreign admixtures ($HgCl_2$ and acetic acid) to the solution does not affect the position of the absorption maxima.

N.G. Bakhshiyev

MUSTAFIN, K.S.

Determining the temperature of the positive column in argon from the Doppler width of the atomic line. Uch.zap.Tadzh.un. 18:103-110 '58. (MIRA 14:7)

(Electric discharges through gases) (Spectrum, Atomic)

MUSTAFIN, K. S., Cand Phys-Math Sci -- "Study of the parameters of a positive discharge column under ~~average~~ medium pressures." Stalinabad, 1960 (Len Order of Lenin State Univ im A. A. Zhdanov). (KL, 4-61, 184)

radiation intensity of columns with the lengths $l_1$, $l_2$; $S(k_o l)$ is the factor taking reabsorption into account (Ref. 3); and $k_o$ is the absorption coefficient. The results are shown in Table 1.

| Pressure, mm Hg | Term | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $^1P_1$ | | | $^3P_o$ | | | $^3P_1$ | | | $^3P_2$ | | |
| | amperage, a | | | | | | | | | | | |
| | 0.05 | 0.2 | 0.4 | 0.05 | 0.2 | 0.4 | 0.05 | 0.2 | 0.4 | 0.05 | 0.2 | 0.4 |
| 1 | 2.4 | 2.5 | 2.8 | 8 | 7 | 6 | 30 | 30 | 28 | 60 | 56 | 45 |
| 5 | 1.5 | 1.2 | 1.5 | 2.3 | 1.8 | 1.8 | 10 | 8 | 9 | 17 | 13 | 13 |
| 10 | 0.6 | 1 | 1.5 | 1.7 | 1.7 | 2 | 8 | 9.5 | 9 | 14 | 13 | 14 |
| 20 | 0.5 | 0.8 | 1.1 | 2 | 1.8 | 1.6 | 9 | 10 | 9 | 15 | 15 | 15 |

The concentration of metastable neon atoms calculated from the Maxwell distribution was ten times as high as the experimental values. Consequently, no Maxwell distribution can be assumed here. 2) The concentration of the excited atoms was determined by the radiation method, by a comparison with

86338

Concentrations of Excited Atoms and Temperatures of Inert Gases in a Positive Column

S/054/60/000/004/015/015
B004/B056

the known spectrum of a tungsten lamp. The gas temperature was measured from the Doppler broadening, argon and neon being found to behave differently. In neon, the gas temperature rises with increasing amperage, especially at low pressure, whereas in argon, the gas temperature increases with rising pressure but depends only little on amperage. These phenomena are ascribed to a contraction of argon. The author thanks S. E. Frish for supervising the present work, and Yu. M. Kagan and N. S. Penkin for a discussion. There are 3 figures, 4 tables and 17 references: 13 Soviet, 1 Dutch, and 3 German.

Card 3/3

MUSTAFIN, K.S.

Concentrations of excited atoms and temperatures of inert gases in the positive column of a discharge [with summary in English]. Vest. LGU 15 no.22:130-137 '60. (MIRA 13:11)
(Neon--Spectra) (Electric discharges through gases)

S/057/60/030/04/07/009
B004/B002

AUTHORS: Zakharova, V. M., Kagan, Yu. M., Mustafin, K. S., Perel', V. I.

TITLE: Probe Measuring Under Middle Pressures

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 4, pp. 442-449

TEXT: It was the purpose of the present paper to investigate the applicability of the Langmuir probe for measuring the characteristic plasma values at pressures higher than 1 torr. The authors derived equations (4), (5) for the ion currents directed upon spherical and cylindrical probes with strong negative charges, and their current densities (equations 8-10). Furthermore, equation (11) is given for the plasma potential $V_0$. The following method of measuring the characteristic plasma values is suggested: a) the electron temperature $T_e$ is determined by means of the two-probe method given in Ref. 11; b) the electron concentrations are determined by means of equations (4), (5) and by applying the electron section of the characteristics. The effective cross

/B

sections of the ion overcharge, gas temperature, and concentration of the normal atoms must be known for the determination of the ion concentration $n_{\infty}$. The theoretical calculations are experimentally proven in Hg vapor at $10^{-1}$ to 1 torr. Table 1 shows that the values $n_{\infty}$ of spherical and cylindrical probes are in good agreement with calculations. Furthermore, plasma measurements were carried out in neon and argon at 1 to 20 torr, 50, 200, and 400 ma, and in Hg at 10 torr, 0.5, 1.0, 1.5, and 2.0 a. Table 2 gives the field voltages of Ne and Ar, Table 3 the values of $T_e$, Table 4 the density of the ion current, and Table 5 the values of $n_{\infty}$. The $T_e$ values were taken according to Ref. 14 and measurements by O. P. Bochkova. The dependence of the electron concentration distribution on pressure in the case of Ne and Ar, is given in Figs. 1 and 2. These Figs. show that a pressure increase is accompanied by a compression along the axis, and differs for Ne and Ar. The column contraction observed, and the difference between calculated and measured wall current related thereto, indicate that the Schottky theory no longer holds true for the pressures applied. The authors finally investigate the



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Probe Measuring Under Middle Pressures

S/057/60/030/04/07/009
B004/B002

possible effect of electron- and photon emission on the result of their method, and prove this effect to be very low. They mention a paper by N. P. Penkin, and thank Professor S. E. Frish for the interest he took in this paper. There are 2 figures, 5 tables, and 16 references: 10 Soviet, 3 American, 1 British, and 1 Japanese.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: July 16, 1959

Card 3/3

/B

S/057/60/030/008/010/019
B019/B060

AUTHORS: Kagan, Yu. M., Mustafin, K. S.

TITLE: The Velocity Distribution Function of Electrons in a Positive Discharge Column of Mean Pressure

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 8, pp. 938 - 947

TEXT: With reference to papers by Smit, Druyvesteyn, and V. Ye. Golant, the authors devote the first three sections of the present article to deriving the velocity distribution functions of electrons in the positive columns in neon, argon, and mercury under consideration of elastic and inelastic impacts. They obtain formulas (8), (20), and (26), and discuss them. The fourth section deals with the shapes of distribution functions, and in Tables 1, 2, and 3 the measured temperatures of electron gas are compared with those obtained by calculation. Moreover, the measured axial electron concentrations are compared with those calculated in Tables 4, 5, and 6. In the discussion of results in the final part, reference is made to the satisfactory agreement achieved in the first three tables, and

VB

Card 1/2

The Velocity Distribution Function of Electrons S/057/60/030/008/010/019
in a Positive Discharge Column of Mean Pressure B019/B060

it is stated that the nonelastic collisions must be considered at pressures below 1 torr. It is further shown that while there is an interaction between the electrons, it exerts little influence on the calculation of the electron gas temperature and of the oriented velocity. This influence is discussed. The authors finally thank V Ye. Golant and V. I. Perel' for their discussion of results. There are 1 figure, 6 tables, and 8 references: 6 Soviet and 2 American

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im A A Zhdanova
(Leningrad State University im A A Zhdanov)

SUBMITTEL: February 15, 1960

VB

Card 2/2

S/057/62/032/010/005/010
B104/B102

AUTHORS: Mustafin, K. S., and Protasevich, V. I.

TITLE: Determination of the plasma parameters in an Ne-Hg mixture

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 10, 1962, 1216-1222

TEXT: To supplement a previous paper (Yu. M. Kagan, K. S. Mustafin, ZhTF, XXX, 938, 1960) the parameters of the positive column in neon with Hg admixture is calculated and the results are compared with experimental data. In a discharge tube of 20 mm diameter the electron concentration is measured with a probe and the strength of the longitudinal electric field is measured by a compensation method at Ne pressures of 0.5-1 mm Hg and Hg pressures of $10^{-3}$ - $10^{-2}$ mm Hg at discharge amperages of 1-25 ma. Assuming

$$\left.\begin{array}{ll} x<1 & s=s_0x^{1/4}, \\ x>1 & s=s_0; \quad \frac{ns_0}{p_1}=11.5\ \frac{\text{см}^2}{\text{см}^3\cdot\text{мм рт. ст.}} \end{array}\right\} \quad (2)$$

for Ne and

Card 1/4

Determination of the plasma ...

$$x<0.29 \quad s^{Hg}_{н.у.}=0,$$
$$0.29<x<1 \quad s^{Hg}_{н.у.}=s^{Hg}_{0\,н.у.}\cdot x^{1/4},$$
$$x>1 \quad s^{Hg}_{н.у.}=s^{Hg}_{0\,н.у.};\ \frac{ns^{Hg}_{0\,н.у.}}{p}=34\ \frac{см^2}{см^3\cdot мм\ рт.\ ст.}.$$

(4) for Hg, and proceeding from the kinetic equation

$$-\frac{4}{3}\gamma^2\frac{d}{dx}\left(x\lambda^*\frac{d\varphi_0}{dx}\right)=2\frac{m}{M}u_0^2\frac{d}{dx}\left(\frac{x^2}{\lambda^*}\varphi_0\right)-\frac{xu_0^2}{\lambda_{н.у.}}\varphi_0,$$

$\lambda^*=\frac{1}{ns^*}$ —

(1) for the isotropic part of the electron velocity distribution function $\varphi_0(x)$, the author arrives at $\varphi_0(x)=x^{1/4}\left[C_1I_{1/4}\left(\frac{4}{5}\sqrt{\beta_2}\,x^{5/4}\right)+C_2K_{1/4}\left(\frac{4}{5}\sqrt{\beta_2}\,x^{5/4}\right)\right]$ (10) for the range $0.29<x<1$ and

$$\varphi_0=C_3x^{-1/2}\sqrt{\beta_1(x-1)+\beta_2^{-1/4}}\cdot K_{1/3}\left\{\frac{2}{3\beta_1}\left[\beta_1(x-1)+\beta_2^{-1/4}\right]^{3/2}\right\}$$ (15) for the range $x>1$. Symbols in the equations: $x=v^2/u_0$; $u_0=2eU_0/m$, $U_0=16.5$ ev is the first Ne level; $\gamma=eE/w$, $\lambda^*$ is the diffusion length $\lambda_{н.у.}$ is the mean free path with respect to inelastic collisions, s and $s_{н.у.}$ are the

Card 2/4

Determination of the plasma ...

Here $B = 1.86 \cdot e^{0.63\sqrt{\beta_1}} \cdot e^{1.8 \cdot 10^{-3}\alpha}$,

$A = 1.86 \cdot e^{0.63\sqrt{\beta_1}}(0.062\alpha - 0.68 - 0.29\sqrt{\beta_1})$,

$C = B - 2.94 \cdot A \cdot e^{1.8 \cdot 10^{-3}\alpha}$.

, $p_1$ is the Hg pressure and E the electric field strength. The electron drift velocity is

$$a = -\frac{1}{3}\sqrt{\frac{2e}{mU_0}}E^0 \frac{\int_0^\infty e^{-x}\frac{d\varphi_0}{dx}dx}{\int_0^\infty F(x)\,dx}$$

(25) in the range $0 \leq x < 1$. The comparison shows satisfactory results. It is concluded that consideration of the Coulomb interaction occurring between the electrons and of elastic collisions between electrons and atoms will give better results. There are 5 figures and 2 tables.

ASSOCIATION: Tadzhikskiy gosudarstvennyy universitet im. V. I. Lenina (Tadzhik State University imeni V. I. Lenin)

SUBMITTED: November 21, 1961

Card 4/4

L 25372-65 EWT(1)/EWG(k)/EWT(1)/EWT(m)/EPA(sp)-2/T/EEC(t)/EWP(b)/EWA(m)-2/EWP(t)/EPF(c)/EPA(w)-2 Pz-6/Po-4/Pab-10/Pr-4/Pi-4 IJP(c) JD/AT

ACCESSION NR: AP5003036 S/0051/65/018/001/0141/0143

AUTHOR: Mustafin, K. S.; Khashimov, N. M.

TITLE: Determination of the effective cross section for collisions of the second kind between metastable neon atoms and hydrogen molecules

SOURCE: Optika i spektroskopiya, v. 18, no. 1, 1965, 141-143

TOPIC TAGS: collision cross section, neon, hydrogen, metastable atom, hydrogen dissociation, high frequency plasma, discharge plasma

ABSTRACT: The authors have determined the effective cross section of the collision reaction

$$Ne(3s\ ^3P_2) + H_2 = Ne(^1S_0) + H^* + H + 0.05\ ev \qquad (1)$$

in a high-frequency 50-watt discharge (50 and 0.2 Mc) in a tube 15 mm in diameter. The electrical characteristics of the plasma were determined with the aid of two cylindrical probes sealed into the tube and situated in the same tube cross section. To determine the efficiency of this reaction, spectra fro- the

Card 1/2